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A Modified Utilization Gauge for Western Range Grasses

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Accurate, low cost measurements of forage utilization by livestock are essential in range management and the evaluation of grazing systems. However, because of difficulty in making these measurements, visual estimates often are substituted for measured values. To help land managers better determine use, range utilization calculating charts (Crafts 1938, NRCAB 1962) have been revised into a utilization gauge. Height-weight distributions of two additional southwestern grasses have been measured and incorporated into this gauge.

Keywords: Range management, grass utilization, grazing, livestock

Description

The utilization gauge includes 43 culmed and culmless western grass species (fig. 1). Included in the 43 species, are two new height-weight relationships for species representing Southwest semiarid rangeland sites. These species are alkali sacaton (*Sporobolus airoides* (Torr.) Torr.) and Indian ricegrass (*Oryzopsis hymenoides* (R. + S.) Ricker).

Fifty-four ungrazed plants of each of the two additional species were collected on the Rio Puerco Watershed in northwest New Mexico at the peak of growth after flowering and seed set, and were air dried. Plants of representative heights from this semiarid rangeland were cut into 10% height segments, and each segment was weighed to the nearest gram. The accumulated weight of each plant, by 10% height segments, was calculated from the top of the culm to the base, and was converted to percent. Each 10% segment for all 54 plants was averaged, and plotted on graph paper. The result was a height-weight distribution curve (fig. 2). Percent use for a given stubble height was then read from the curve and plotted to give an additional set of values for the utilization gauge.

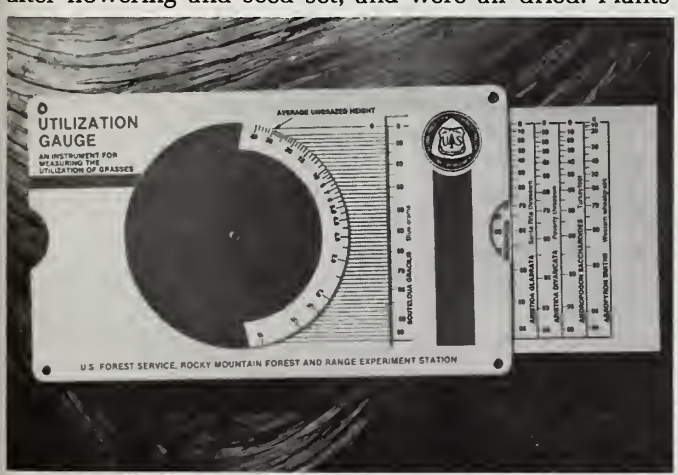

Figure 1.—Utilization gauge showing *Bouteloua gracilis* height-percent utilization relationships.

Figure 2 illustrates Indian ricegrass and alkali sacaton height-weight relationships. This curve shows that when 90% of the height growth of Indian ricegrass is taken, 82% of the weight has been removed. For alkali sacaton, when 90% of the height growth is taken, only 66% of the weight has been removed.

The modified utilization gauge was developed primarily for the major southwestern grass species, but it includes several widely distributed western grass and grass-like species. The gauge is field portable and is easily read after measuring the height of both grazed and ungrazed plants. The ungrazed height is set at the top of the dial, the grazed height is read across the dial, and the percent utilization is read in the window by species. Figure 1 shows an ungrazed height of 30 inches.

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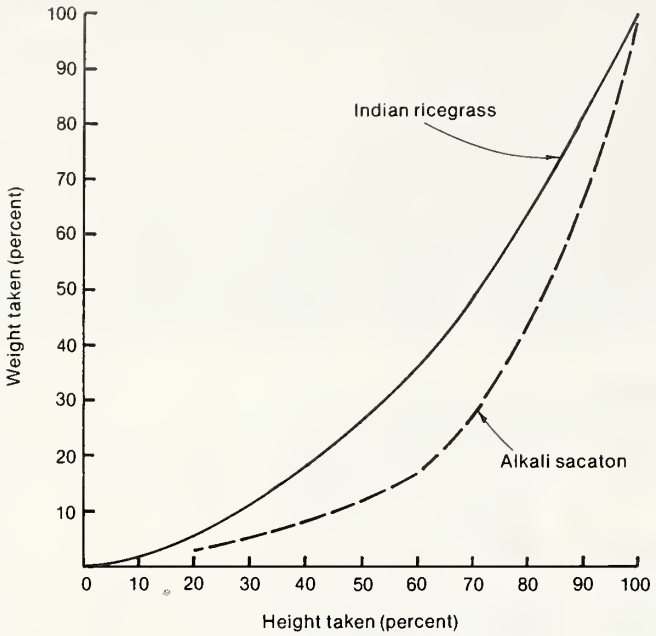

Figure 2.—Height-weight utilization percentages for Indian ricegrass and alkali sacaton.

At a grazed height of 10 inches, utilization of blue grama is 20%. Detailed instructions for field use are printed on the back of the gauge. Gauges are available from the authors.

Literature Cited

Crafts, Edward C. 1938. Height-volume distribution in range grasses. Journal of Forestry 36(12):1182-1185.

National Research Council, Agriculture Board, Subcommittee on Range Research Methods (NRCAB). 1962. Basic problems and techniques in range research. Chapter 5. National Research Council Publication 890, 341 p. National Academy of Science, Washington, D.C.

Nickerson, Mona F., Glen E. Brink and Charles Feddema. 1976. Principal range plants of the central and southern Rocky Mountains: Names and symbols. USDA Forest Service General Technical Report RM-20, 121 p. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

Appendix

Other species (Nickerson et al. 1976) included on the gauge are:

Agropyron cristatum (L.) Gaertn.
Agropyron smithii Rydb.
Agropyron spicatum (Pursh) Scribn. + Smith
Andropogon gerardii Vitman (= *Andropogon furcatus* Muhl.)
Andropogon saccharoides Swartz
Andropogon scoparius Michx.
Aristida divaricata Willd.
Aristida glabrata (Vasey) Hitchc.
Bouteloua chondrosioides (H.B.K.) Wats.
Bouteloua curtipendula (Michx.) Torr.
Bouteloua eriopoda (Torr.) Torr.
Bouteloua filiformis (Fourn.) Griffiths
Bouteloua gracilis (H.B.K.) Steud.
Bouteloua hirsuta Lag.
Bouteloua rothrockii Vasey
Buchloe dactyloides (Nutt.) Engelm.
Calamagrostis rubescens Buckl.
Carex douglasii Boott
Carex filifolia Nutt.
Deschampsia caespitosa (L.) Beauv.
Distichlis stricta (Torr.) Rydb.
Festuca arizonica Vasey
Festuca idahoensis Elmer
Heteropogon contortus (L.) R. + S.
Hilaria belangeri (Steud.) Nash
Hilaria jamesii (Torr.) Benth.
Hilaria mutica (Buckl.) Benth.
Koeleria cristata Pers.
Lycurus phleoides H. B. K.
Muhlenbergia emersleyi Vasey
Muhlenbergia montana (Nutt.) Hitchc.
Muhlenbergia porteri Scribn.
Oryzopsis hymenoides (R.+ S.) Ricker
Poa sandebergii Vasey (= *Poa secunda* Presl)
Scleropogon brevifolius Phil.
Sporobolus airoides (Torr.) Torr.
Sporobolus cryptandrus (Torr.) Gray
Stipa columbiana Macoun
Stipa comata Trin. + Rupr.
Stipa richardsonii Link
Trichachne californica (Benth.) Chase